REMARKS

The Examiner is thanked for the performance of a thorough search. By this amendment, Claims 14, 15, 16, 17, 23, 25 and 41 have been amended. Claims 37 and 38 have been cancelled. The claims were amended to conform to Examiner's renumbering of the claims. It is respectfully submitted that the amendments to the claims as indicated herein do not add any new matter to this application.

DRAWINGS

Enclosed are corrected drawings for FIG. 4, FIG. 6, FIG. 7 and FIG. 17. The drawings were corrected according to suggestions of the Draftperson's Review.

Each issue raised in the Office Action mailed September 30, 2002 is addressed hereinafter. It is respectfully submitted that the rejection of the Claims as amended are over come for reasons given hereafter.

SUMMARY OF REJECTIONS/OBJECTIONS

In the Office Action, Claims 37 and 38 recite the limitation "as set forth in claim 29" in line 1, and are rejected under 35 U.S.C. § 112, alleging that there is insufficient antecedent basis for this limitation in the claim.

Claims 1-10, 12, 14-21, 23, 25-28, and 37-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Furusawa* (U.S. Patent 6,338,081) in view of "Information Brokering in an Agent Architecture" by Martin.

REJECTIONS UNDER 35 U.S.C. § 112

In the Office Action, Claims 37 and 38 recite the limitation "as set forth in claim 29" in line 1, and are rejected under 35 U.S.C. § 112, alleging that there is insufficient antecedent basis for this

limitation in the claim.

Please cancel claims 37 and 38. Further, Claims 14, 15, 16, 17, 23, 25 and 41 have been amended to conform with Examiner's renumbering of the claims.

REJECTIONS UNDER 35 U.S.C. § 103(a)

CLAIMS 1, 2-10, 12 and 42

Independent Claim 1 is reproduced in part below:

> "A computer-implemented method for **communication and cooperative task completion between a community of distributed electronic agents and at least one other distributed component system**, the other distributed component system including a component registry providing access to a plurality of distributed components registered therein, the method comprising the acts of:
>
> receiving from a **bridge agent** a description of functional capabilities of the components registered in the component registry, **the bridge agent being capable of translating** between a dynamically expandable interagent communications language ("ICL") understood by **the community of distributed electronic agents** and an **incompatible** protocol understood by **the distributed component system**;"

The limitations of Claim 1 are to be read in the context of **communication and cooperative task completion between a community of distributed electronic agents and at least one other distributed component system**. In other words, Claim 1 is to be read in the context of the community of distributed electronic agents being able to access the capabilities of distributed components in the at least one other distributed component system.

The access to the capabilities of distributed components in the at least one other distributed component system is made possible because the **bridge agent** is "capable of translating ... "ICL" understood by the community of distributed electronic agents and an incompatible protocol understood by the distributed component system." This is a unique feature because the capabilities of distributed component systems, typically, can be accessed only in limited fixed interactions which are hard coded in a given software application. The limited access

to and collaboration with distributed component systems is due to the lack of a **bridge agent** that is "capable of translating ... "ICL" understood by the community of distributed electronic agents and an incompatible protocol understood by the distributed component system." Thus, the limitations of Claim 1 make possible for the community of distributed electronic agents to exploit the capabilities of other distributed component systems.

In contrast, *Furusawa* only discloses an agent community, i.e. the community of distributed electronic agents. *Furusawa* describes how the components **within** the agent community interact. *Furusawa* neither discloses nor suggests how the agent community would interact and exploit other distributed component systems, which are **incompatible** with the agent community. Similarly, *Martin* describes the interactions within an agent community.

Claims 2-10 and 12, either directly or indirectly, depend from Claim 1 and include all the limitations of Claim 1, and therefore are allowable for at least the reasons provided herein with respect to Claim 1. Furthermore, it is respectfully submitted that Claims 2-10, 12 and 42 recite additional features that independently render Claims 2-10, 12 and 42 patentable over *Furusawa* and *Martin*, either taken alone or in combination.

CLAIMS 39, 14-21, and 23

Independent Claim 39 contains limitations similar to those of Claim 1. Claim 39 is reproduced in part below:

> "A computer readable medium containing a program providing instructions for coordinating communication and cooperative task completion between **a community of distributed electronic agents** and at least one **other distributed component system**, the other distributed component system including a component registry providing access to a plurality of distributed components registered therein, said instructions performing the steps of:
>
> receiving from a bridge agent a description of functional capabilities of the components registered in the component registry, the **bridge agent being capable of translating** between a dynamically expandable interagent communication language

(" ICL") understood by the program and an incompatible protocol understood by the **distributed component system**;"

Therefore, Claim 39 is allowable for at least the reasons provided herein with respect to Claim 1. Claims 14-21, and 23, either directly or indirectly, depend from Claim 39 and include all the limitations of Claim 39, and therefore are allowable for at least the reasons provided herein with respect to Claim 39. Furthermore, it is respectfully submitted that Claims 14-21, and 23 recite additional features that independently render Claims 14-21, and 23 patentable over *Furusawa* and *Martin*, either taken alone or in combination.

CLAIMS 40, and 41

Independent Claim 40 contains limitations similar to those of Claim 1. Claim 40 is reproduced in part below:

"A software-based flexible computer architecture for communication and cooperative task completion between a **community of distributed electronic agents and at least one other distributed component system**, the other distributed component system including a component registry providing access to a plurality of distributed components registered therein; the computer architecture comprising:

a plurality of electronic agents capable of communicating in a dynamically expandable interagent communication language ("ICL"), at least one of the agents being a **bridge agent capable of translating** between the ICL and an **incompatible** protocol understood by **the distributed component system**, and further capable of providing a description of functional capabilities of the components registered in the component registry;"

Therefore, Claim 40 is allowable for at least the reasons provided herein with respect to Claim 1. Claim 41 directly depends from Claim 40 and include all the limitations of Claim 40, and therefore is allowable for at least the reasons provided herein with respect to Claim 40.

Furthermore, it is respectfully submitted that Claim 41 recites additional features that independently render Claim 41 patentable over *Furusawa* and *Martin*, either taken alone or in combination.

CONCLUSION

For the reasons set forth above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is believed next in order, and that action is most earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is encouraged to call the undersigned at (650) 838-4311.

The Commissioner is authorized to charge any fees due to Applicants' Deposit Account No. 50-2207.

Respectfully submitted,
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14. (Twice Amended) A computer readable medium as recited in claim 39 [37], wherein the ICL request for service originates as an incompatible request for service generated in the incompatible protocol by one of the components registered in the multiple component registry, the method further comprising the steps of:

transmitting the incompatible request for service to the bridge agent; and

translating the incompatible request for service into the ICL; and

transmitting the incompatible request for service from the bridge agent to the facilitator.

15. (Twice Amended) A computer readable medium as recited in claim 39 [37], wherein the ICL request for service is received from the community of distributed electronic agents.

16. (Twice Amended) A computer readable medium as recited in claim 39 [37] further comprising the steps of:

receiving functional capabilities of one or more of the distributed electronic agents, the agent being independent of the multiple component registry;

adding the agent functional capabilities to the facilitator registry;

generating a second ICL sub-goal; and

selecting from the facilitator registry an agent capable of completing the second ICL sub-goal.

17. (Twice Amended) A computer readable medium as recited in claim 39 [37], wherein the components registered in the multiple component registry are software based objects.

23. (Twice Amended) A computer readable medium as recited in claim 39 [37], further comprising the step of periodically updating the facilitator registry.

25. (Twice Amended) A software based flexible computer architecture as recited in claim 40 [38], wherein the components are software based objects and the multiple component registry is a distributed object service.

Please cancel claims 37 and 38 (as renumbered by the Examiner) without prejudice.

41 [39]. (Once Amended) A software based flexible computer architecture as recited in claim 40 [38] wherein the bridge agent is integral with the facilitator.

Version of Abstract With Markings Showing Changes Made

A distributed agent community is able to dynamically interact with alternative sofware technologies that manage distributed objects. The leveraging of capabilities of distributed object systems greatly expands the flexibility and capabilites of the distributed agent community. Through access to distributed object systems, the distributed agent community can draw on the capabilites of all the objects managed by the distributed object systems. The access to distributed systems by the distributed agent community allows for collaboration and intelligent planning that the distributed object systems do not themsleves provide.

[A highly flexible, software-based architecture is disclosed for constructing distributed systems. The architecture supports cooperative task completion by flexible, dynamic configurations of autonomous electronic agents. Communication and cooperation between agents are brokered by one or more facilitators, which are responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents. It is not generally required that a user or agent know the identities, locations, or number of other agents involved in satisfying a request, and relatively minimal effort is involved in incorporating new agents "wrapping" legacy applications. Extreme flexibility is achieved through an architecture organized around the declaration of capabilities by service-providing agents, the construction of arbitrarily complex goals by users and service-requesting agents, and the role of facilitators in delegating and coordinating the satisfaction of these goals, subject to advice and constraints that may accompany them. Additional mechanisms and features including facilities for creating and maintaining shared repositories of data; the use of triggers to instantiate commitments within and between agents; agent-based provision of multimodal user interfaces including natural language; mechanisms for selecting a most appropriate interpretation from among a plurality of possible interpretations of multimodal inputs; and built-in support for including the user as a privileged member of the agent community. Specialized embodiments providing enhanced scalability are also described. Still other embodiments which allow the

facilitator to leverage the services of an incompatible distributed object system or distributed agent are also described, whereby the resources available to the facilitator are greatly enhanced.]